Vol. 99. Part 10. Pp. 341–360, 1 fig. 11th October, 1948

COMMONWEALTH INST. ENTOMOLOGY LIBRARY
13 OCT 1948
SERIAL Ent. 344
SEPARATE

THE

TRANSACTIONS

OF THE

ROYAL ENTOMOLOGICAL SOCIETY

OF

LONDON

World List abbreviation : *Trans. R. ent. Soc. Lond.*

CONTENTS

PAGE

HYNES, H. B. N. Ph.D., A.R.C.S., F.R.E.S. Notes on the aquatic Hemiptera-Heteroptera of Trinidad and Tobago, B.W.I., with a description of a new species of *Martarega* B. White (NOTONECTIDAE) . . . . . 341–360, 1 fig.

LONDON:
PUBLISHED BY THE SOCIETY AND
SOLD AT ITS ROOMS, 41, QUEEN'S GATE, S.W. 7

Price 6s. 6d.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

Founded 1833. Incorporated by Royal Charter 1885.

Patron—HIS MAJESTY THE KING.

OFFICERS AND COUNCIL FOR THE SESSION, 1948-1949.

C. B. WILLIAMS, M.A., Sc.D., *President.*
G. FOX-WILSON, N.D.H.
B. M. HOBBY, M.A., D.PHIL. } *Vice-Presidents.*
MISS C. E. LONGFIELD
A. WELTI, *Treasurer.*
N. D. RILEY, *Secretary.*
E. B. BRITTON, M.Sc., *Editor.*

Other Members of the Council.

R. L. E. FORD.
R. M. GREENSLADE.
A. G. HAMILTON, B.Sc., B.AGR., PH.D., D.I.C.
CAPT. R. A. JACKSON, C.B.E., R.N.
H. B. D. KETTLEWELL, M.A., M.B., B.CHIR., M.R.C.S., L.R.C.P.
A. M. MASSEE, D.Sc.
G. E. J. NIXON, B.A.
J. A. SIMES, O.B.E.
W. H. THORPE, Sc.D.
A. J. A. WOODCOCK, M.Sc.

MISS E. EVANS, *Registrar.*

Finance and House Committee.
G. FOX-WILSON, N.D.H. (Chairman).

C. L. COLLENETTE.
A. G. GABRIEL.
H. E. HINTON, B.Sc., PH.D.
CAPT. R. A. JACKSON, C.B.E., R.N.
A. M. MASSEE, D.Sc.

Publication and Library Committee.
W. H. THORPE, M.A., Sc.D. (Chairman).

PROF. G. D. HALE CARPENTER, M.B.E., D.M.
A. G. HAMILTON, B.Sc., B.AGR., PH.D., D.I.C.
G. E. J. NIXON, B.A.
J. SMART, B.Sc., PH.D.
T. H. C. TAYLOR, D.Sc.

Committee on Generic Nomenclature.
FRANCIS HEMMING, C.M.G., C.B.E. (Chairman).

W. A. F. BALFOUR-BROWNE, F.R.S.E.
K. G. BLAIR, D.Sc.
O. W. RICHARDS, M.A., D.Sc.
N. D. RILEY (Secretary).

Committee for the Protection of British Insects.
H. M. EDELSTEN, O.B.E. (Chairman).

R. B. BENSON, M.A.
E. A. COCKAYNE, M.A., M.D., F.R.C.P.
R. L. E. FORD.
B. M. HOBBY, M.A., D.PHIL.
CAPT. R. A. JACKSON, C.B.E., R.N.
COL. F. A. LABOUCHERE.
A. M. MASSEE, D.Sc.
THE HON. MIRIAM ROTHSCHILD.
N. D. RILEY (Secretary).

The Executive Officers of the Society are *ex-officio* members of all Committees.

DELEGATES OF THE SOCIETY TO :

1. **British National Committee for Biology** (Royal Society).
   Francis Hemming, C.M.G., C.B.E., appointed 1946.
   Dr. V. B. Wigglesworth, M.A., B.Ch., M.D., F.R.S., appointed 1943.
2. **Local Committee of Management of Wicken Fen.**
   M. H. M. Edelsten, O.B.E. (nominated by Committee for the Protection of British Insects).
3. **National Trust for Places of Historic Interest or Natural Beauty.**
   M. H. M. Edelsten, O.B.E., appointed 1944.
4. **New Forest Association.**
   Mr. C. W. Mackworth Praed, appointed 1948.
5. **New Forest Joint Committee.**
   Mr. W. Fassnidge, appointed 1939.
   Dr. F. J. Killington, D.Sc., A.L.S., appointed 1939.
6. **Royal Meterological Society. Phenological Committee.**
   Dr. C. B. Williams, M.A., D.Sc., appointed 1937.
7. **Council for the Promotion of Field Studies.**
   Dr. W. H. Thorpe, M.A., Sc.D., appointed 1944.
8. **Joint Bioclimatic Committee.**
   Dr. B. P. Uvarov, C.M.G., D.Sc., appointed 1945.
   Dr. C. B. Williams, M.A., D.Sc., appointed 1945.
9. **Yorkshire Naturalists' Trust, Ltd.**
   Mr. W. D. Hincks, M.P.S., appointed 1946.

NOTES ON THE AQUATIC HEMIPTERA-HETEROPTERA OF TRINIDAD AND TOBAGO, B.W.I., WITH A DESCRIPTION OF A NEW SPECIES OF *MARTAREGA* B. WHITE (NOTONECTIDAE).

By H. B. N. Hynes, Ph.D., A.R.C.S., F.R.E.S.

(*Department of Zoology, University of Liverpool.*)

(Manuscript received 1st August, 1947.)

(Read 2nd June, 1948.)

With One Text-figure.

Contents.

	PAGE
Introduction	341
Acknowledgments	342
Taxonomic notes	342
Physiographical notes	342
List of species obtained in Trinidad	343
List of species obtained in Tobago	344
Biological and distributional data from Trinidad	344
Biological and distributional data from Tobago	356
Description of a new species of *Martarega* B. White 1879	358
Summary	359
Literature cited	359

Introduction.

From November, 1941 to July, 1942, while a Colonial Agricultural Scholar at the Imperial College of Tropical Agriculture, St. Augustine, Trinidad, B.W.I., I spent some of my spare time collecting aquatic Heteroptera. I was also able to do a small amount of collecting in the neighbouring island of Tobago, during a brief visit in April, 1942.

As little but purely taxonomic work has been done on the Neotropical representatives of this group, I have felt it worth while to set down such ecological data as I was able to obtain, despite the fact that in many ways my records are incomplete and unsatisfactory.

The data on many species are inadequate to do more than indicate habitat preferences, but it has been possible to show that in some genera different species occupy different ecological niches, and by the time I left the West Indies I was at any rate able to guess what species I might find in any given locality. The collections varied considerably in their thoroughness, and no localities, except in St. Augustine, were visited more than twice. Also, owing to the greater ease with which they are observed and collected, my data on the Gymnocerata are more complete than those on the Cryptocerata. No Cryptocerata were seen in Tobago.

ACKNOWLEDGMENTS.

I wish here gratefully to acknowledge the help that Dr. W. E. China of the British Museum has given me by identifying the collection, which I brought back to England, and describing three of the new species that were obtained. He has also assisted me in the description of the new species of *Martarega* and been kind enough to read through this paper, and has generously placed his special knowledge at my disposal. I am also grateful to Mr. R. J. Izzard for naming the BELOSTOMATIDAE, the late Dr. A. M. Adamson for giving me many specimens of NEPIDAE and BELOSTOMATIDAE from collections in the Entomology Department of the Imperial College of Tropical Agriculture, and Dr. E. M. McC. Callan for several useful records.

TAXONOMIC NOTES.

At the time that the collections were made I knew nothing of the taxonomy of New World aquatic Heteroptera, and had no access to the scattered literature. As it was not possible always to preserve the specimens obtained I grouped the species into " species A," " species B," etc., and mounted a good series of each from several localities, most of which survived the wartime journey to England, and were submitted to Dr. China for identification. This has led to difficulties because two of my " species " have proved to consist each of two species, with the result that records of these species from localities from which no specimens are now available cannot be referred definitely to either species. My data on *Brachymetra* and *Mesovelia* are, therefore, less complete than they might have been. In case other confusions, which were not evident from my preserved collection, occurred, I have marked all those localities from which Dr. China or Mr. Izzard have actually seen specimens with an asterisk (*). I must also add that I alone am responsible for naming the two species of NEPIDAE, which was done with the aid of the collection in the British Museum.

Most of the collection on which these notes are based has been presented to the British Museum.

PHYSIOGRAPHICAL NOTES.

The types of country in which collections were made were as follows :

1. Dense upland forest and the similar cacao plantations traversed by steep rapid heavily shaded stony streams, most of which are called rivers, although all are shallow and usually narrower than 20 yards across.
2. Flat lowland country covered by cultivation or secondary bush with small pools, drainage dykes and large deep muddy rivers.
3. Rice fields and areas of grassy swamp traversed by drainage and irrigation dykes.
4. Mangrove swamps and the large sluggish mangrove-fringed rivers leading into them or into the sea.
5. Marine localities.

Most of my collections were made in the northern half of Trinidad within a few miles of St. Augustine and Port of Spain, but isolated collections were made in several places scattered over the northern half of the island.

LIST OF SPECIES OBTAINED IN TRINIDAD.

Gymnocerata :		
MESOVELIIDAE	*Mesovelia mulsanti* . . .	B. White
	Mesovelia amoena . . .	Uhler
HYDROMETRIDAE	*Hydrometra kirkaldyana* . .	Bueno
GERRIDAE	*Limnogonus guérini*. . .	Lethierry and Severin
	Limnogonus hyalinus . .	Fabricius
	Cylindrostethus palmaris .	Drake and Harris
	Brachymetra albinervis . .	Amyot and Serville
	Brachymetra unca . . .	Shaw
	Metrobates spissus . . .	Drake and Harris
	Rheumatobates imitator . .	Uhler
	Hynesia mangrovensis . .	China
	Hynesia trinitatis . . .	China
	Halobates micans . . .	Escherich
VELIIDAE	*Rhagovelia elegans* . . .	Uhler
	Rhagovelia tenuipes . .	Champion
	Rhagovelia sp. nr. *femoralis* .	Champion
	Rhagovelia calopa . . .	Drake and Harris
	Microvelia robusta . . .	Uhler
	Microvelia mimula . . .	B. White
	Microvelia longipes . . .	Uhler
	Microvelia trinitatis. . .	China
	Microvelia distanti . . .	Lundblad
	(= *insignis* . .	Distant)
	Microvelia stellata . . .	Kirkaldy
Cryptocerata :		
CORIXIDAE	*Tenagobia socialis* . . .	B. White
	Trichocorixa verticalis . .	(Fieber)
NOTONECTIDAE	*Buenoa* sp. nr. *elegans* . .	Fieber
	Buenoa carinata . . .	Champion
	Buenoa scimitra . . .	Bare
	Martarega chinai sp. n.	
NEPIDAE	*Curicta scorpio* . . .	Stål
	Ranatra macropthalma . .	Guzana
BELOSTOMATIDAE	*Belostoma micantula* . .	Stål
	Belostoma anura . . .	Herrich-Schaeffer
	Lethocerus annulipes . .	(Herrich-Schaeffer)
	Lethocerus americanum . .	Leidy
	Lethocerus grandis . . .	(L.)
	Lethocerus uhleri . . .	Montandoni

Three of these species have previously been recorded, in literature, from the island, i.e. *Brachymetra albinervis* and *B. unca* (Shaw, 1933) and *Microvelia distanti* (Scott, 1912), and Dr. China has listed the species of GERRIDAE and VELIIDAE in my collection (China, 1943*a* and *b*).

In addition the following species have been recorded from Trinidad, but were not represented in my collections: *Tenagogonus adamsoni* Drake (Drake, 1940), *Velia myersi* Hungerford, from tree-holes (Hungerford, 1931),

Velia tersa Drake and Harris, from narrow reaches of small streams (Drake and Harris, 1941), *Microvelia myersi* McKinstry (McKinstry, 1937) and *Tenagobia incerta* Lundblad (Deay, 1935). Dr. China tells me that there is some doubt that *M. myersi* is a truly distinct species. It was described from two specimens, one of which was taken in Trinidad at the same time as five specimens of *M. robusta*, from which it differs chiefly in the presence of a ventral tubercle. Similarly he informs me that *T. incerta* is usually regarded as only a variety of *T. socialis*, and that my specimens belong to this variety, which Deay states is also recorded from the nearby island of Grenada.

In addition to the BELOSTOMATIDAE listed above as recorded from Trinidad, Mr. Izzard has identified as *Belostoma boops* Duf. two specimens, found in old collections in the I.C.T.A. Entomology Department, labelled "St. Vincent F.A.S. 1.xii.36" and "Grenada." As this species occurs on these nearby islands it seems probable that it may also be found in Trinidad.

LIST OF SPECIES OBTAINED IN TOBAGO.

Gymnocerata :

GERRIDAE	*Brachymetra albinervis* . .	Amyot and Serville
	Trepobates commitialis . .	Drake and Harris
VELIIDAE	*Velia brachialis* . . .	Stål
	Rhagovelia plumbea. . .	Uhler
	Rhagovelia tenuipes. . .	Champion

Apart from Dr. China's list (China, 1943*b*) of the VELIIDAE in my collection, I know of no previous records of aquatic Heteroptera from Tobago.

BIOLOGICAL AND DISTRIBUTIONAL DATA FROM TRINIDAD.

Mesovelia spp.

When making the collections *Mesovelia mulsanti* B. White was confused with *M. amoena* Uhler, with the result that the occurrence of *Mesovelia* in three localities cannot be referred to either species.

M. mulsanti was found in November, December and January, nymphs being usually present with the adults, and, in the localities where the species was plentiful, the wingless form predominated. In all the localities where it was found there was either emergent or floating aquatic vegetation with which the insects seemed to be definitely associated, and the water was either still or slowly flowing. They were always found amongst the vegetation, only ran on to the water when disturbed, and were able to drift rapidly with the wind. Winged specimens were often found with the membrane of the wing, and often also the clavus, eroded away. Dr. China suggests that this may facilitate copulation, as has been suggested for the similar phenomenon observed in the HALOBATINAE. Hungerford (1919) describes similar habitats for the species in temperate N. America, and figures a male with partly eroded wings. The species appears to fly readily, as winged adults were seen several times on a concrete swimming pool which was frequently drained and cleaned.

M. amoena was taken only once when two winged adults, both with eroded wings, were found in company with *M. mulsanti* on a cattle pool in a rice field.

M. mulsanti was recorded from Puddle, St. Augustine* 4.xi.41 ; I.C.T.A. Farm Pond* 4 and 23.xi.41 and 4.i.42 ; Madame Espagnole River, Caroni*

20.xii.42 ; Cattle pool in rice fields, Caroni* 20.xii.41 ; I.C.T.A. swimming pool* 8.i.42.

M. amoena was recorded from : Cattle pool in rice fields, Caroni* 20.xii.41.

Mesovelia sp. was recorded from : Caroni swamp 21.i.42 ; Quarry pools, Valencia 4.ii.42 ; Pool on Piarco Savanna 14.ii.42.

Hydrometra kirkaldyana Bueno.

Only two adults and one nymph of this species were taken, all being found in emergent grass bordering on the flooded parts of rice fields.

The records are as follows : Rice field, Caroni* 7.xi.41 ; Rice field, St. Augustine* 11.xii.41 ; Pool in rice field, Caroni* (nymph) 20.xii.42.

Limnogonus guérini Lethierry and Severin.

Winged and wingless adults and nymphs were found, usually singly or in small numbers from November to February. They were only found on still or very slowly flowing water, and were not confined to shady places. This species does not form shoals, and in habits and habitat appears to resemble the European *Gerris lacustris* L., which it resembles in general appearance.

Recorded from : Puddle, St. Augustine 4.xi.41 ; I.C.T.A. Farm Pond 4 and 23.xi.41 ; Dyke in rice fields, Caroni* 7.xi.41 ; Rice fields, St. Augustine* 11.xii.41 and 1 and 17.i.42 ; Drains beside Yarra River, Blanchisseuse 27.xii.41 ; Pool on Piarco Savanna* 14.ii.42 ; Drain on Piarco Savanna 14.ii.42.

Limnogonus hyalinus Fabricius.

Adults were found from November to May, but nymphs were only taken from January to May. Breeding continued on pools right throughout the dry season (April). Winged adults were found in twos and threes on many types of water, but wingless adults and nymphs, and therefore presumably breeding, were apparently confined to still water. It appears therefore that this species flies well, and to all types of water, but breeds only on still water. Winged adults were several times seen on rapid streams, but they were always in small numbers, and sheltering near the bank from the main force of the current. It is noticeably a more robust species than other still-water species of GERRIDAE occurring on the island which do not apparently settle on running water. The winged form was more common than the wingless ; the insects were not seen to form shoals, and were not apparently confined to shady localities.

Recorded from : Arouca River* 29.xi.41 and 25.iv.42 ; Tributary to Maracas River* 17.xii.41 ; Pool in rice field, Caroni* 20.xii.41 ; Near bank of Yarra River, Blanchisseuse* 27.xii.41 ; I.C.T.A. Swimming Pool* 8.i.42 ; Rice fields, St. Augustine* (breeding) 17 and 27.i.42 ; Quarry Pool, Valencia (breeding) 4.ii.42 ; Tacarigua River 4.ii.42 ; Guayamare River 14.ii.42 ; Oropuna River, Piarco* 14.ii.42 ; Maracas River (breeding in bay) 21.ii.42 ; Drain on Piarco Savanna (breeding) 8.iii.42 ; Dyke, Nariva Swamp (breeding ; dry season) 5.iv.42 ; Rice fields, Tunapuna (breeding ; dry season) 3.v.42.

Cylindrostethus palmaris Drake and Harris.

Wingless adults and nymphs were found, in November, February and April, in considerable numbers on large deep pools in heavily shaded mountain streams. They were never seen on turbulent or still water, nor in unshaded localities which appeared otherwise suitable, and no winged adults were seen. This is a large and amazingly agile species, and even young nymphs are difficult to net. It apparently forms loose shoals like those of the European *Gerris najas* Deg.

Recorded from: Tacarigua River* 17.xi.41 and 4.ii.42; Arouca River* 22 and 29.xi.41 and 25.iv.42; Oropuna River, Piarco* 14.ii.42; Maracas River* 21.ii.42.

Brachymetra spp.

When making the collections, *Brachymetra albinervis* Amyot and Serville was confused with *B. unca* Shaw, with the result that the following notes must apply to both species together. They were several times collected together, and I venture to suggest that further work may possibly indicate that the two are in fact only one species.

Adults and nymphs were found in most months from November to May, the wingless adults being far more common than the winged. They always occurred on running water, at all heights from sea level to over 2000 ft., and always in or near the shade. All but one specimen were taken on rapid streams, where they lurked along the banks out of the main force of the current. The single specimen was winged, and was found alone on a small sluggish brook. The insects were always present in fairly small numbers, and did not apparently form shoals.

B. albinervis was recorded from: Aripo River* 9.xi.41; TacariguaRiver* 17.xi.41 and 4.ii.42; Arouca River* 22 and 29.xi.41; Tributary to Maracas River* 17.xii.42; Stream pool on El Tucuche,* 2200 ft. 10.i.42.

B. unca was recorded from: Aripo River* 9.xi.41; Tacarigua River 17.xi.41; Stream pool on El Tucuche* 10.i.42; Stream south of Morne Bleu*, 1400 ft. 8.ii.42; Arouca River* 29.xi.41.

In addition, specimens of *Brachymetra*, which are not now available for specific identification, were recorded from: Streams south of Morne Bleu, 1500 ft. 8.ii.42; Oropuna River, Piarco 14.ii.42; Streams San Juan Estate, Montserrat, 600 ft. 8.ii.42; Maracas River 21.ii.42; stream between Aripo and Chaguaramal 15.iii.42; Mouth of Yarra River, Blanchisseuse (in shade) 17.v.42; St. Joseph River 29.v.42.

Metrobates spissus Drake and Harris.

Adults and nymphs, which occurred together in large compact shoals, were only taken in two localities which were visited in November, February and March. One locality was a clear mountain stream, and the other a large swift muddy lowland river. In the mountain stream, which was heavily shaded by rain forest, the species occurred only on the large relatively still pools, in company with *Cylindrostethus palmaris*, and was dark coloured. In the lowland river, which was open to the sun, and with turbid buff-coloured water, the shoals of adults and nymphs were found along the banks, in the

shelter of logs, etc., which broke the force of the current. In the latter locality the species was pale and inconspicuous against the pale water. The difference between the light and dark forms lay in the relative areas of pale grey and black on the thorax and abdomen, but in several preserved specimens the grey areas have become obliterated by fats which seeped out through the integument after death. No winged adults were seen.

Anderson (1932) states that species of this genus are gregarious, and that winged individuals are rare. Hungerford (1919) states that *M. hesperius* Uhler is lacustrine in N. America and that little else is known of it.

Recorded from: Tacarigua River* 17.xi.41 and 4.ii.42; Caroni River, Piarco* 14.ii.42 and 8.iii.42.

Trepobates commitialis Drake and Harris.

Winged and wingless adults and nymphs were found commonly from November to April, but at the end of the short dry season (early May) only nymphs could be found, indicating that, in the Neotropics, the difficult season is passed over by immature stages. In contrast with this, Hungerford (1919) states that the adult *T. pictus* Herrich-Schaeffer overwinters in N. America. In Trinidad the winged form was more common than the wingless, and it appeared to fly readily, as specimens occurred frequently on a swimming pool which was often drained and cleaned, and on a small newly-dug cattle pool. A curious feature, observed also in other HALOBATINAE (Schroeder, 1931), was that many winged specimens were found to have some or all of their wings broken off short, about half their length from base to tip. The fracture was always neat and transverse, and the wings appeared to have a line of weakness, as they could easily be induced to break along the normal fracture-line. It seems that when a winged adult finds a suitable habitat the wings are truncated, and it is unable to fly again. Perhaps this indicates that wings are an encumbrance to the species when living on water, and Dr. China informs me that it has been suggested that the shortening of the wings facilitates copulation. The actual shedding of the wings was not observed, but specimens were found with the fracture almost complete on one wing and the others still entire.

The species was always found singly or in small numbers in many places in the north of the island, and did not apparently form shoals. It was only found on still or almost still water, and was able to tolerate direct sunlight. Hungerford (1919) states that in N. America *T. pictus* inhabits ponds.

Recorded from: Puddle, St. Augustine* 4.xi.41, I.C.T.A. Farm pond* 4 and 23.xi.41 and 4.i.42, I.C.T.A. Swimming Pool several times between 4.xi.41 and 28.iv.42; Rice fields, St. Augustine* 11.xii.41 and 17 and 27.i.42; Dykes beside Yarra River, Blanchisseuse 27.xii.41 and (nymphs) 17.v.42; Small pool, St. Augustine 27.i.42; Quarry Pools, Valencia 4.ii.42; Pools in Guayamare River, Madras Settlement 14.ii.42; Slow section of Oropuna River, Piarco* 14.ii.42; Dyke, Nariva Swamp 5.iv.42; Rice fields, Tunapuna (nymphs) 3.v.42.

Rheumatobates imitator Uhler.

Wingless adults and nymphs were found in November, December, January and April only in St. Augustine and Nariva swamp, which are both flat grassy areas with rice fields and other cultivation. The insects occurred in large

swarms on small open muddy pools in irrigation and drainage dykes. Nymphs were far more common than adults, and females were more common than the fantastically modified males. The winged adults were not found in the swarms, but one male nymph with developing wings was found in a swarm in November, and in the same month two winged females, presumably of this species, were collected on a concrete farm pond. Unfortunately both were destroyed in transit, so it has not been possible to confirm the identification. They resembled the wingless form except that the mesonotum was uniformly black without a central yellow patch. The wings were white with black veins, and in one specimen they were truncated like those of *Trepobates commitialis*. Schroeder (1931) states that winged adults of this genus often break off their wings leaving only the corium and clavus. Despite their small size these insects are very active and hard to catch, and can jump long distances. Hungerford (1919) states that *R. rileyi* Berg. is gregarious and very easily disturbed, and that in Kansas it is common on muddy ponds and pools.

Recorded from: I.C.T.A. Farm Pond (2 winged females) 23.xi.41; Rice fields, St. Augustine* 23.xi.41 and 11.xii.41 and 17 and 27.i.42; Dyke, Nariva Swamp* 5.iv.42.

Hynesia mangrovensis China.

Dr. China (1943*a*) described this genus and species as new, from specimens in my collection. *H. mangrovensis* was found only in the Yarra River, at its mouth, only about 100 yards from the sea. The river is very muddy and tidal, but closed at low tide by a sand bar. It is some 40 yards wide and fringed with coconut plantation and mangrove. At the collecting site, which was visited in December and May, the water was distinctly brackish, and many marine animals occurred. *H. mangrovensis* occurred in vast swarms of mixed adults and nymphs, which maintained their position in the dense shade of mangroves by swimming against the current. The lighter shade of the coconut palms seemed to be insufficient, as few specimens were seen in it. In the late afternoon the swarms spread out over the water.

Recorded from: Yarra River, Blanchisseuse* 27.xii.41 and 17.v.42.

Hynesia trinitatis China.

Dr. China (1943*a*) described this species as new from specimens in my collection. Wingless adults and nymphs were found only in the Caroni swamp and Madame Espagnole River, which flows into it. The swamp is a large muddy area of shallow brackish water, dotted with clumps of mangrove, and heavily polluted with the effluent of a cane sugar factory. The whole area of the swamp teems with fishes, crabs and birds. *H. trinitatis* was exceedingly common, occurring in vast swarms under the shade of the mangroves. It was far more abundant in the swamp than in the river. Both species of this genus appear therefore to be confined to shaded brackish water.

Recorded from: Caroni Swamp* 15 and 21.i.42; Madame Espagnole River, Caroni* 21.i.42.

Halobates micans Eschericb ?

One *Halobates* nymph, which Dr. China has tentatively identified as *H. micans*, was found by Mr. D. K. Kevan, washed up on the beach at Mayaro,* in the east of the island, on 15.i.42.

Rhagovelia elegans Uhler.

Adults and nymphs were found from November to April on several densely shaded rapid streams on the Northern Range. They were never found on slow-flowing water nor above 1400 ft. nor below 300 ft. where the streams tended to flatten out. They were often found on the same streams as *R. tenuipes*, but unlike that species occurred on streams of all sizes. The winged form was uncommon. The insects formed shoals, not usually mixed with those of *R. tenuipes*, and the shoals of adults, larger and smaller nymphs were usually separate. The shoals of very young nymphs were found only near the bank out of the current, or behind large emergent rocks. The older insects spent their time darting about vigorously on the swift-flowing water. These observations are in close agreement with the account given by Hungerford (1919) of the habits and habitat of this genus in N. America. It is presumably the peculiarly modified tarsus of the second leg which enables the insect to maintain itself in such rapid water. *R. elegans* has been recorded from the nearby island of Grenada (Gould, 1931).

Recorded from: Aripo River* 9.xi.41: Tacarigua River* 17.xi.41 and 4.ii.42: Arouca River 17.xi.41 and 25.iv.42: Tributary to Maracas River* 17.xii.41: Streams south of Morne Bleu, 1400 ft. 8.ii.42; Streams, San Juan Estate, Montserrat 18.ii.42: Maracas River 21.ii.42.

Rhagovelia tenuipes Champion.

Adults and nymphs were taken in November, February, April and May on three large, heavily shaded, mountain streams on the Northern Range, all of which were at least 10 yards across. They were not found on any smaller streams. Their habits appeared to be similar to those of *R. elegans*, but they were frequently seen on extremely turbulent water, which was avoided by the latter species. The species was apparently absent from streams above about 800 ft., possibly because these were not large enough. Its lower limit, however, seemed to be lower than that of *R. elegans*, but this statement is based on one locality only. The winged form was absent from all stations collected except the lowest, where a few winged adults were collected in May from the St. Joseph River. The nymphs were easily distinguished from those of *R. elegans* because of their polished metallic appearance. It seems that this species inhabits the larger swift shaded streams and is absent from smaller streams. Perhaps this preference is associated with the relatively longer legs and shorter, broader body of this species as compared with other species of the genus.

Recorded from: Tacarigua River* 17.xi.41 and 4.ii.42: Arouca River* 29.xi.41 and 25.iv.42: Maracas River* 18.ii.42: St. Joseph River* (= lower reaches of Maracas River) 29.v.42.

Rhagovelia sp. near *femoralis* Champion.

Dr. China has been unable to identify this species, which he believes to be new, and which is neither *R. abrupta* Gould nor *R. panda* Drake and Harris, both of which are closely allied.

Winged and wingless adults and nymphs were taken in January, February and March from several small mountain forest streams on El Tucuche and Morne Bleu (peaks in the Northern Range). The lowest station was 1400 ft. and the highest 2400 ft., and at such altitudes the climate is noticeably cooler than it is in the other parts of the island. This appeared to be the only species of *Rhagovelia* occurring at these altitudes, although it was once found together with a few *R. elegans* at 1400 ft. The winged form was far less common than the wingless. All the high streams on which it occurred were very small, steep and densely shaded, and the insects were most common on the quieter pools between rapids, where there were sometimes as many as about 10 per square yard of water. This is a lower concentration than was normally observed in shoals of the other species.

Recorded from: Stream on El Tucuche,* 2400 ft. 10.i.42; Streams south of Morne Bleu,* 1400 ft., 1500 ft., and 1800 ft. 8.ii.42; Stream between Aripo and Chaguaramal,* 1800 ft. 15.iii.42.

Rhagovelia calopa Drake and Harris.

Wingless adults and nymphs were found in February, March and May on the lower reaches of four streams flowing off the Northern Range. The species did not apparently occur on the swifter water above about 200 ft., and only once was found together with *R. tenuipes* in St. Joseph River. Like *R. tenuipes* and *R. elegans* it occurred in shoals, but, unlike the other species, it was found on sluggish turbid water, and was not apparently confined to shady places. On the wide Caroni River it ranged far out into the open water, but where the current was swifter the shoals tended to lie behind logs and other obstructions. This species therefore seems to prefer slower currents than the others, and is able to tolerate sunshine. It is possible, however, that the other species would be found on unshaded water if it flowed fast enough, but in Trinidad all swift streams run through dense vegetation. In connection with its peculiar habitat it may be noted that *R. calopa* has shorter legs and is more hump-backed than the other species.

Recorded from: Caroni River, Piarco* 14.ii and 8.iii.42; Oropuna River, Piarco* 14.ii.42; Drain, Piarco Savanna 8.iii.42; St. Joseph River* 29.v.42.

It appears, therefore, that in Trinidad there is a definite zonation of species of *Rhagovelia*, and that each one occupies a definite ecological niche. The operating factors seem to be the current and size of stream, altitude (temperature?), and possibly also shade. Above about 1400 ft. *Rhagovelia* sp. alone occurs. Below about 1400 ft. *R. elegans* replaces *Rhagovelia* sp. and occupies the small streams, and the quieter parts of the large streams, down to about 300 ft. From about 800 ft., where the streams begin to become larger and swift, down to about 200 ft. *R. tenuipes* occupies the swifter parts of the large streams, which are avoided by *R. elegans*. Below about 200 ft., where the streams flatten out and become sluggish, only *R. calopa* occurs. This is

doubtless an over-simplified picture of the state of affairs, and probably would be altered in detail by further work, but I feel that the broad outline is substantially correct. It is probable, for instance, that along the north of the island, where steep shady streams run almost straight into the sea, *R. calopa* would be found not to occur, and *R. tenuipes*, and possibly also *R. elegans* on the smaller streams, would be found down to the sea level. My collections from Tobago show that *R. tenuipes* can occur close to the sea on steep shaded streams.

Another point of interest is that I gained the impression that, where winged forms of species of *Rhagovelia* were found they were commoner near the limits of the range of the various species than they were elsewhere. Unfortunately my collections were not made with the object of determining this, but I feel that it is worthy of further investigation.

Microvelia robusta Uhler.

Nymphs and adults were found from November to February in many lowland still water localities, and amongst the emergent vegetation of two slow-flowing rivers. The winged adults were more common than the wingless, and were frequently found on temporary water, indicating that they fly readily. The species was three times found in company with *M. mimula*; in two localities *M. robusta* only was found on one visit and *M. mimula* only on the next. Wingless adults and nymphs, indicating breeding sites, were found on many types of still or gently flowing water (e.g. pools, ponds, ditches, irrigation channels, emergent vegetation of rivers, etc.).

Recorded from: Concrete ditch, St. Augustine* 3.xi.41; I.C.T.A. Farm Pond* 4 and 23.xi.41; Pool, St. Augustine* 4.xi.41; Irrigation channels and pools in rice fields, St. Augustine* 23.xi and 11.xii.41 and 17 and 27.i.42; Emergent vegetation, Madame Espagnole River, Caroni 20.xii.41; Pool in rice fields, Caroni* 20.xii.41; Sunken iron water-butt, St. Augustine* 4.i.42; Quarry Pools, Valencia 4.ii.42; Pool in dry Guayamare River, Madras Settlement 14.ii.42; Pool on Piarco Savanna 14.ii.42; Slow reach, Oropuna River, Piarco* 14.ii.42.

Microvelia mimula B. White.

Nymphs and adults were found in December, January and February in a few still water localities in St. Augustine, Valencia and Madras Settlement. The winged form was commoner than the wingless. Noticeably this species was only found in very small bodies of water (small pools, ditches, drains, etc.), where it bred freely, and although in three such localities *M. robusta* was also found, only winged adults of the latter were present. It appears therefore that, while winged adults of *M. robusta* may visit any body of still water, the two species normally breed in different localities, *M. robusta* breeding on larger bodies of still water and *M. mimula* only on very small bodies of water. In this connection it is interesting to note that *M. mimula* is a more slightly built and fragile species than *M. robusta*, which is well named.

Recorded from: Sunken iron water-butt, St. Augustine* 7.xi.41; Concrete drain, St. Augustine* 4.i.42; Irrigation channels and pools in rice fields, St. Augustine* 17.i.42; Quarry Pools, Valencia 4.ii.42; Pools in dry Guayamare River, Madras Settlement 14.ii.42.

Microvelia longipes Uhler.

Nymphs were found in December and January, and winged and wingless adults in December, January and February in the same localities as *M. mimula*; these species appear therefore to have similar habitat preferences, and do not apparently interfere with one another, despite their small habitats. It was noted that the larger, more agile *M. longipes* inhabited the centres of the pools, while, unless disturbed, *M. mimula* was always very near the bank. Both species occurred in the open sunlight, but were more plentiful where shade was available. In localities where *M. longipes* was common the hind legs of many of the males were elongate, and ranged from the proportions normal for the genus up to four times the length of the body. Elsewhere, where only a few specimens were present, this phenomenon was not observed. It is difficult to suggest any reason for this, or any function that the elongate legs perform, especially as the long-legged specimens are both winged and wingless, and occur together with short-legged and intermediate specimens, and the character is confined to the males. Noticeably, however, the long-legged males ran more swiftly, but presumably there is some compensating disadvantage, because otherwise one would expect all males to have long legs, especially where the species was uncommon, and presumably establishing itself against some ecological disadvantage.

Recorded from: Sunken iron water-butt, St. Augustine* 7.xii.41 and 4.i.42; Concrete drain, St. Augustine* 4.i.42; Pools in rice fields, St. Augustine* 27.i.42; Quarry pools, Valencia 4.ii.42; Pools in dry Guayamare River, Madras Settlement* 14.ii.42.

Microvelia trinitatis China.

Dr. China (1943*b*) has described this species as new, from specimens in my collection. One brachypterous adult and winged adults and nymphs were found in two very small upland forest pools at 2400 ft. and 2700 ft. in January. Both pools were in dense rain forest and were produced by water seeping out of rocks above them. One pool was overhung by rock, and the other lay at the bottom of a steep wet rock face. Apparently the species, which was plentiful on both pools, was absent from similar localities at lower altitudes.

Recorded from: Rock seepage pool, El Tucuche* 2400 ft. 10.i.42; Rock seepage pool, El Tucuche* 2700 ft. 10.i.42.

Microvelia distanti Lundblad (= *insignis* Distant).

Distant in Scott (1912) described this species from Trinidad and Dominica, and I had the good fortune to find it again in the type locality on the summit of El Tucuche, and also on the neighbouring mountain, Morne Bleu. I was also informed by Dr. Shannon and Mr. Pittendrigh of the Rockefeller Research Institute, who were working on anopheline mosquitos breeding in Bromeliaceae, that it is common in the forest areas of the island. This interesting species is apparently confined to the water that collects in the leaf-bases of epiphytic Bromeliaceae, where it is associated with a peculiar fauna. Scott (1912) has already described this fauna, and my observations are in complete agreement with his. I am able to add, however, a few details about *M. distanti*. Each Bromeliad plant contains about one pint of water, and this harbours

up to about ten specimens of *M. distanti*. Winged and wingless adults and nymphs were found in January and February, but adults were less common than nymphs, and the winged adults less common than the wingless. Amongst the large number of plants examined, very few were without specimens. It is remarkable that this species, which is not seen unless especially searched for, by pouring out the water from the plant, should be so strikingly coloured when compared with other species of the genus. It is interesting also to consider what may form the food of this species. The small Crustacea which form a large part of the food of allied forms (Hungerford, 1919) are absent, and it would seem that insects would not often fall on to the sheltered and small water surface. Perhaps they feed on the eggs and young larvae of the numerous mosquitos that are a constant feature of the fauna.

Recorded from : Water in BROMELIACEAE, summit of El Tucuche* 3072 ft. 10.i.42 ; Water in BROMELIACEAE, Morne Blue,* 1400 ft. 8.ii.42.

Microvelia stellata Kirkaldy.

Only one winged specimen was found, in July, and nothing was discovered about its natural habitat as it was not seen in the field.

Recorded from : Indoor wash basin, St. Augustine* 15.vii.42.

Tenagobia socialis B. White.

Adults and nymphs were found in November, December and February in large numbers in still, or slowly flowing, muddy shallow water. The species was not found in any other type of habitat, nor in water that was more than very slightly brackish, but in April many adults appeared in the almost empty stagnant swimming pool at St. Augustine, which was not filled during the dry season. None had been observed there at other times of the year when the pool was clean and full. This indicates that the species flies readily, and is confined to shallow muddy fresh water. It appeared to be widely distributed in such habitats in the north of the island.

Recorded from : I.C.T.A. Farm Pond,* 23.xi.41 ; Irrigation dykes in Rice Fields, St. Augustine* 23.xi.41 ; Madame Espagnole River, Caroni* 20.xii.41 ; Quarry pools, Valencia* 4.ii.42 ; Pools in dry Guayamare River, Madras Settlement* 14.ii.42 ; I.C.T.A. Swimming pool* 28.iv.42.

Trichocorixa verticalis (Fieber) (= *reticulata* Guérin).

This species was only found in a natural habitat in the brackish Caroni swamp in January, where nymphs and adults were very common in the shallow muddy water of the mangrove swamp. In addition one isolated female was taken in the slightly brackish nearby Madame Espagnole River, and in April during the dry season a few adults appeared in the almost empty stagnant swimming pool, mentioned above. It appears, therefore, that this is a brackish water species which does, however, fly a few miles inland during the dry weather, and possibly also at other times. It was not, however, seen in any other inland locality, nor in any deep or flowing brackish water. This distribution in brackish localities only is in close agreement with the findings of Hutchinson (1931), who records the species from the sea in Delaware Bay, and ponds near

the sea in New Jersey. It seems, therefore, that throughout its range it is definitely a halophile insect.

Recorded from: Madame Espagnole River, Caroni* (one female) 20.xii.41; Mangrove swamp, Caroni* 21.i.42; I.C.T.A. Swimming pool (adults only) 28.iv.42.

Buenoa sp. near *elegans* Fieber.

Dr. China believes that this species is new to science, but, unfortunately, since his examination all the specimens have been destroyed. Adults and nymphs were taken in several bodies of still clear water in the northern half of the island. The species was abundant where it occurred, specimens of all sizes being obtained in December and January. In addition odd adults appeared in the swimming pool from December to April, indicating that it flies readily. No specimens were found in swiftly flowing or very turbid water, and the insects were seen to spend most of their time at, or a short distance below, the surface in the open water away from vegetation. Hungerford (1919) describes similar habits for *B. margaritacea* Bueno in N. America.

Recorded from: Sunken iron water-butt, St. Augustine* 17.xii.41; I.C.T.A. Swimming pool* (adults only) many times between 2.xii.41 and 28.iv.42; Rice fields, St. Augustine* 11.xii.41 and 17.i.42; Pools in rice fields, Caroni 20.xii.42; Dykes beside Yarra River, Blanchisseuse 27.xii.41.

Buenoa carinata Champion.

Only one adult specimen was taken, and it was not seen in a natural habitat.

Recorded from: I.C.T.A. Swimming pool* 8.i.42.

Buenoa scimitra Bare.

Only one adult specimen was taken, and it was not seen in a natural habitat.

Recorded from: I.C.T.A. Swimming pool* 28.iv.42.

Martarega chinai sp. n.

This species, which is closely related to *M. membranacea* B. White, is described below. It was found in only one locality, a deep sluggish stream about 10 yards wide with reed-like grass in places, and some true aquatic vegetation (*Cabomba* sp.), which is a comparatively rare feature in most types of Trinidadian fresh water. *M. chinai* was abundant in the clear open water, both nymphs and adults being present. A striking feature of this species which it shares with some other members of the sub-family Nychini (Hungerford, 1933) is the absence, or reduction, of hind wings. Wings are absent in all my specimens, but Jaczewski (1928) states that fully winged specimens of *Martarega* occasionally occur, and it must be these that allow of dispersal of the species. It seems probable that *M. chinai* may occur in many sluggish lowland streams in Trinidad, but this is a type of locality in which I made few collections.

Recorded from: Oropuna River, Piarco* 14.ii.42.

Curicta scorpio Stål.

One damaged specimen labelled "Moruga" in what appears to be the hand-writing of Dr. F. W. Urich was found in an old collection in the I.C.T.A. Entomology Department.

Ranatra macropthalma Guzana.

Three damaged specimens labelled "1928," "Central Range, 25.vi.24 C. L. Withycombe" and "15.viii.24 C. L. Withycombe," all presumably collected in Trinidad, were found in old collections in the I.C.T.A. Entomology Department.

Belostoma micantula Stål.

Adults of this small species were found frequently from November to July in still and slowly flowing water, but nymphs were taken only in bodies of water where vegetation was present. As has often been noted (Hungerford, 1919), the males of this genus carry the eggs on their backs, and males with eggs were often found even in localities such as the I.C.T.A. swimming pool, where the nymphs appeared unable to survive probably because of the lack of vegetation or other cover, and suitable food. As the male is unable to fly with the eggs, which cement his fore-wings together, one must presume that the females had laid them in the unsuitable localities. The species obviously flies readily, as adults were so often found in places where the species appeared not to breed, and that flight occurs at night is indicated by the capture of four specimens which flew into a light at 10 p.m. It appears, therefore, that this species may occur in any body of still or almost still water, and that it breeds where vegetation or other shelter is present. Unlike larger Belostomatids it was very common.

Recorded from: Rice fields, Caroni 7.xi.41; Rice fields, St. Augustine* 23.xi.41; I.C.T.A. Swimming pool* several times between 23.xi.41 and 28.iv.42; Pool in rice fields, Caroni* 20.xii.41; Sunken iron water-butt, St. Augustine 4.i.42; Pools in dry Guayamare River, Madras Settlement 14.ii.42; Caroni River, Piarco 14.ii.42; Pool on Piarco Savanna* 14.ii.42; At light, St. Augustine* 10 p.m. 9.vii.42.

Belostoma anura Herrich-Schaeffer.

One adult and several nymphs were collected amongst vegetation on the bank of a large sluggish river. In the same month Dr. Callan received specimens of this species for identification, from the Naval Air Station at Piarco, with a report that when an aeroplane landed, a vast cloud of these insects rose from the grass runway, and several people complained of being bitten. Five other specimens labelled "Trinidad" were found in old collections in the I.C.T.A. Entomology Department.

Recorded from: Madame Espagnole River, Caroni 20.xii.41; Piarco Aerodrome* xii.41.

Lethocerus annulipes (Herrich-Schäeffer).

Three specimens were found in old collections in the I.C.T.A. Entomology Department, one labelled "Trinidad"* and one "St. Augustine, 10.xii.23, Sir F. Watts," and one with no data.

Lethocerus americanus Leidy.

One specimen was taken in Nariva swamp, a large grassy marsh with clumps of tall Royal Palms and tree-like Ferns, and two specimens labelled "Trinidad" and "San Fernando" vi. 10. C. B. Williams" were found in old collections in the I.C.T.A. Entomology Department, together with three unlabelled specimens presumably also from Trinidad.

Recorded from: Nariva Swamp* 7.iv.42.

Lethocerus grandis (L.).

Only one specimen of this enormous species was taken, but there were many unlabelled specimens in old collections in the I.C.T.A. Entomology Department, three labelled "Trinidad" and one labelled "St. Augustine" 28 v 38. J. G. Smith." There are also several specimens labelled "Trinidad" in the British Museum collection.

Recorded from: Swamp near I.C.T.A. Farm pond, 5.iv.42.

Lethocerus uhleri Montandon.

One specimen labelled "Trinidad" was found in an old collection in the I.C.T.A. Entomology Department.

Bionomical and Distributional Data from Trinidad.

Brachymetra albinerva Amyot and Serville.

Adults and nymphs of *Brachymetra* were collected in five localities, from two of which Dr. China has recorded *B. albinerva*. It is possible that some of the specimens that were not kept were *B. wygodzinskyi*. All five localities were rapid heavily shaded streams similar to the habitat of *Brachymetra* spp. in Trinidad.

Recorded from: Courland River, Les Coteaux* 9.iv.42; Pembroke River* 29 iv 42; Roxborough River, Arden Estate 10.iv.42; Tributary of Roxborough River, Arden Estate 10.iv.42; Doctor's River, Tyrell's Bay 12.iv.42.

Trepobates columbiae Drake and Harris.

Wingless adults and nymphs were found in a small stagnant stream pool shaded by coconut palms and full of decaying algae and water-lilies. The specimens are all darker coloured than those from Trinidad, but the habitat is in accord with the finding that the species occurs on still water.

Recorded from: Pool near mouth of Doctor's River, Tyrell's Bay* 12.iv.42.

Velia brachialis Stål.

Wingless adults, but no nymphs, were abundant on the stagnant pool described above, and one dying winged adult was found helpless amongst stones beside a small stony stream. This species was not found in, and is not recorded from, Trinidad. On the pool the insects were resting on the water-lily leaves and floating debris, and none were seen near the flowing water

a few yards away. Hungerford (1919) implies that all species of *Velia* occur on running water, but *V. mariaella* would appear to prefer stagnant water.

Recorded from:- Roxborough River, Arden Estate* (one winged adult) 10.iv.42; Pond near mouth of Doctor's River, Tyrell's Bay* (wingless adults) 12.iv.42.

Rhagovelia plumbea Uhler.

Three or four hundred mating pairs of wingless adults, together with very few single adults and nymphs, were observed on the sea under a pier at Pigeon Point, and a few specimens were collected. Pigeon Point is a low coral formation, about half a mile long, stretching out into a coral reef lagoon. The reef lies about half a mile out, and is exposed at low tide, but at high tide the Atlantic waves break on the beach of coral sand. At all times there is a swell in the lagoon. The Point is thickly planted with coconut palms. The insects occurred in the shade of a small wooden bathing pier, which stretched for about 30 yards from the beach, and nearly all of them remained in *coitus* all day. The heat of the day they spent darting actively about in the shade of the pier, but in the late afternoon they spread out over the nearby water. None were seen more than a few yards from the pier, and they did not go near the shore, where the small ripple-like waves were breaking. In an extensive search along the shore, both on the open water in a boat and in the shade of fallen and overhanging coconut palms, I failed to find the insects elsewhere. This species is recorded from salt water bays in Florida, Jamaica, St. Vincent and Grenada (Gould, 1931), and it would be very interesting to know more exact details of the habitat. My observations indicate that it requires shade and an absence of waves, but neither trees nor rocks usually extend far enough over the sea to provide both of these, and it seems highly improbable that it depends on such man-made structures as bathing piers. Perhaps it was formerly confined to the edges of mangrove swamps and estuaries, but there is no such locality within miles of Pigeon Point, nor was there before the coconuts were planted.

Recorded from:- Under bathing pier, Pigeon Point* 11.iv.42.

Rhagovelia remigus Champion.

Wingless adults and nymphs were found in four small heavily shaded rapid streams at low altitudes (50–200 ft.). This distribution is noticeably different from the distribution in Trinidad, where the species occurred only on large streams above about 200 ft. It has been suggested above, however, that it may occur at lower altitudes in Trinidad where suitable streams occur, and it may well be that it is driven, by some form of competition, to inhabit only the turbulent, and probably more vigorous, streams when the more robust *R. elegans* is present. *R. elegans* was not found in Tobago, and if, as is possible, it does not occur on very low streams in Trinidad it may be that *R. remigus* can there also inhabit small streams near sea level.

Recorded from:- Courland River, Les Coteaux* 9.iv.42; Pembroke River* 10.iv.42; Tributary to Roxborough River, Arden Estate* 10.iv.42.

Description of a New Species of *Martarega* B. White, 1879.

Martarega chinai sp. n.

The species of *Martarega* collected in Trinidad, although greatly resembling *M. membranacea* B. White (Buchanan White, 1879, and Jaczewski, 1928) differs from it in certain small respects. It is here described as new on the advice of Dr. W. E. China, to whom I am dedicating the species in grateful acknowledgment of his help.

Head yellowish white above, reddish below; eyes large, dark brown to blackish with a paler dorsal posterior border. First rostral joint brown, second pale, third dark brown, fourth black. Ocular commissure more than half as long as the width of an eye when seen from above (ratio 3/5). *Pronotum, scutellum, meso-* and *meta-nota* yellowish white; thorax whitish below with long black hairs along the sides of the ventral surface. *Hemielytra* white with blackish anterior border, two longitudinal shining transparent stripes and a wide transparent area at the base of the hind margin (fig. 1A and B). The anterior stripe is wider in

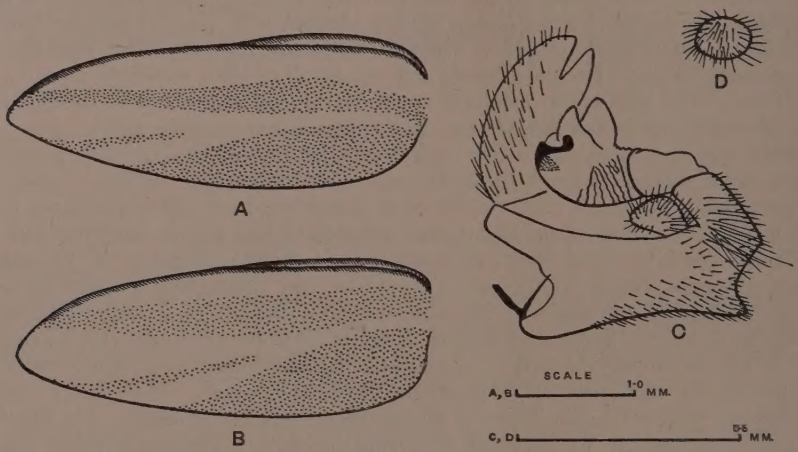

Fig. 1.—*Martarega chinai* sp. n. A, left hemielytron of male; B, left hemielytron of female; C, male genitalia seen from the right; D, left gonapophysis.

the female than in the male, and wider in both sexes than in *M. membranacea* as figured by Jaczewski. The second stripe is short as in *M. membranacea* but does not, as figured for that species by Jaczewski, reach the posterior shining area. *Hind wings* absent in all specimens. *Legs* yellowish white, slightly darker than the thorax; coxae reddish, trochanters and bases of femora dark brown; tarsi not brown at the tip as in *M. membranacea*. Hind femora without basal emargination shown by *M. uruguayensis* (Berg) (Jaczewski, 1928). Relative lengths of the various parts of the legs, measured in percentages of the male front femur:

	Femur.	*Tibia.*	*Tarsus* 1.	*Tarsus* 2.	*Long claw.*	*Short claw.*
Front leg ♂	100	113	57	38	51	41
„ „ ♀	113	113	92	—	57	49
Middle leg ♂	108	124	97	—	68	46
Hind leg ♂	343	314	224	116	19	—

The inner margin of the hind femur with a row of about 30 small spines.

Abdomen greyish above in males, whitish in females; whitish below in both sexes; with long black hairs down the centre and along the sides of the ventral surface. *Male genitalia* similar to other species of the genus in general shape, but asymmetry of the gonapophyses less marked than in *M. uruguayensis* and *M. mcateei* Jaczewski (fig. 1C and D).

Length.—♂ 4·3–4·7 mm. ♀ 4·7–5·1 mm.

Width.—♂ 1·2–1·3 mm. ♀ 1·4–1·5 mm.

Habitat BRITISH WEST INDIES, Trinidad, Piarco, Oropuna River 3 ♂ (including type) and 3 ♀, 14.ii.42 (*Hynes*). These specimens are now in the collection of the British Museum.

This species is easily distinguishable from *M. uruguayensis*, *mcateei* and *M. hondurensis* (1932) by the presence of the wide shining area at the base of the posterior margin of the hemielytron. From *M. membranacea* B. White it is separable by the larger size, the wide anterior stripe on the hemielytron and the absence of any connection between the posterior stripe and the basal shining area, the colour of the eyes and the absence of any brown markings at the tips of the tarsi. It is possible that re-examination of the type series of *M. membranacea* would reveal further differences, but it is equally possible that further collections will show that the above differences are within the range of individual variation of *M. membranacea*.

SUMMARY.

1. The species of aquatic Heteroptera collected in and recorded from Trinidad and Tobago are listed, and collection data are given.

2. The habitat of each species is described in as great detail as the data permit, and where possible the ecological factors controlling habitat preferences are discussed.

3. It is shown that, generally speaking, each species, for which adequate data are available, inhabits a definite and specific ecological niche.

4. A new species of *Martarega* closely allied to *M. membranacea* B. White is described and figured.

LITERATURE CITED.

ANDERSON, L. D., 1932, A Monograph of the genus *Metrobates*. *Kans. Univ. Sci. Bull.* **20** : 297–311.

BARE, C. O., 1932, A *Martarega* from British Honduras. *J. Kans. ent. Soc.* **5** : 60–61.

BUCHANAN WHITE, F., 1879, List of the Hemiptera collected in the Amazons by Professor J. W. Trail, M.A., M.D., in the years 1873–1875, with descriptions of the new species. *Trans. ent. Soc. Lond.* **1879** : 267–276.

CHINA, W. E., 1943*a*, A new genus and two new species of GERRIDAE, sub-family HALOBATINAE from Trinidad. *Proc. R. ent. Soc. Lond.* (B) **12** : 71–80.

——, 1943*b*, A new species of *Microvelia* from Trinidad. *Ibid.* **12** : 121–124.

DEAY, H. O., 1935, The genus *Tenagobia* Bergroth. *Kans. Univ. Sci. Bull.* **22** : 403–477.

DRAKE, C. J., 1940, A new species of *Tenagogonus*. *Rev. chil. Hist. nat.* **44** : 108–109.

——, and HARRIS, H. M., 1941, A new *Velia* from Trinidad. *Rev. Ent., S. Paulo* (*Rio de J.*) **21** : 338–339.

GOULD, G. E., 1931, The *Rhagovelia* of the western hemisphere, with notes on world distribution. *Kans. Univ. Sci. Bull.* **20** : 5–62.

HUNGERFORD, H. B., 1919, The biology and ecology of aquatic and semi-aquatic Hemiptera. *Ibid.* **11** : 1–328.

——, 1931, A new *Velia* from Trinidad. *Ann. Mag. nat. Hist.* (10) **7** : 172–175.

——, 1933, The genus *Notonecta* of the world. *Kans. Univ. Sci. Bull.* **21** : 1–194.

HUTCHINSON, G. E., 1931, On the occurrence of *Trichocorixa* Kirkaldy in salt-water and its zoo-geographical significance. *Amer. Nat.* **65** : 573–574.

JACZEWSKI, T., 1928, NOTONECTIDAE from the state of Parana. *Ann. zool. Mus. polon.* **7** : 121–136.

MCKINSTRY, A. P., 1937, Some new species of *Microvelia*. *J. Kans. ent. Soc.* **10** : 30–41.

SCHROEDER, H. O., 1931, The genus *Rheumatobates* and notes on the male genitalia of some GERRIDAE. *Kans. Univ. Sci. Bull.* **20** : 63–100.

SCOTT, H., 1912, A contribution to the knowledge of the fauna of BROMELIACEAE. *Ann. Mag. nat. Hist.* (8) **10** : 425–438.

SHAW, J. G., 1933, A study of the genus *Brachymetra*. *Kans. Univ. Sci. Bull.* **21** : 221–233.